



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

CIVIL ENGINEERING

COURSE DESCRIPTION FORM

Course Title	CONSTRUCTION MANAGEMENT			
Course Code	A80146			
Regulation	R13 (JNTUH)			
Course Structure	Lecturers	Tutorials	Practical's	Credit's
	5	-	-	4
Course Coordinator	Ch. Balakrishna, Assistant Professor, Civil Engineering			
Team of Instructors	R. Suresh kumar, Assistant Professor, Civil Engineering			

I. COURSE OVERVIEW:

This course provides an understanding of the mechanisms for success within the professional practice of construction management. This preparation includes an understanding of the design, engineering, business and technical principles and practices used in the construction industry. It also includes an awareness of the ethical, social and legal responsibilities of practicing professionals.

II. PREREQUISITE(S):

Level	Credits	Periods/ Week	Prerequisites
-	-	-	-

III. MARKS DISTRIBUTION:

Sessional Marks	University End Exam marks	Total marks
Midterm Test There shall be two midterm examinations. Each midterm examination consists of essay paper, objective paper and assignment. The essay paper is for 10 marks of 60 minutes duration and shall contain 4 questions with two parts A and B. Each part contains two question, the student has to answer 1 question, from each part, each carrying 5 marks. The objective paper is for 10 marks of 20 minutes duration. It consists of 10 multiple choice and 10 fill-in-the blank questions, the student has to answer all the questions and each carries half mark. First midterm examination shall be conducted for the first two and half units of syllabus and second midterm examination shall be conducted for the remaining portion. Five marks are earmarked for assignments. There shall be two assignments in every theory course. Assignments are usually issued at the time of commencement.	75	100

IV. EVALUATION SCHEME:

S. No.	Component	Duration	Marks
1.	I Mid Examination	80 minutes	20
2.	I Assignment	-	5
3.	II Mid Examination	80 minutes	20
4.	II Assignment	-	5
5.	External Examination	3 hours	75

V. COURSE OBJECTIVES:

At the end of the course, the students will be able to:

- I. Apply knowledge of mathematics, science, and engineering principles in construction projects.
- II. Describe the basic concepts and skills required for construction project management
- III. Explain the key issues for building contract procedures, management and administration.
- IV. Apply the techniques of project planning and management in construction projects.
- V. Plan and Schedule a civil engineering project by using techniques like CPM, PERT
- VI. Analyze the different quality and safety issues involved in construction projects.

VI. COURSE OUTCOMES:

After completing this course, the student must demonstrate the knowledge and ability to:

1. Understand different construction techniques and practices.
2. Plan Organizational structure, Human resource management, and leadership.
3. List out the requirements for substructure and superstructure in any construction project.
4. Learn Network Techniques in construction management – Bar chart, Gant chart, CPM, PERT- Cost & Time optimization.
5. Comprehending in Resource planning – planning for manpower, materials, costs, equipment.
6. Introduce the concepts of resource planning and allocation and control in civil projects.
7. Impart the idea about planning and scheduling of activities and scheduling softwares.
8. Evaluate Resource allocation, Budget and budgetary control methods.
9. Analyze contract documents and its specifications.
10. Explain about the construction contract documents and implicate the issues involved in it.
11. Acquire the knowledge about the Quality and safety in construction sites, report through documentation.
12. Understand Labour Regulations Law, social security and welfare Legislation Laws.

VII. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes		Level	Proficiency assessed by
PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	H	Assignments/ Exams
PO2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	H	Assignments/ Exams
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	H	Assignments
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments,	S	-

	analysis and interpretation of data, and synthesis of the information to provide valid conclusions.		
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	-	-
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	H	-
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	H	Assignments/ Exams
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	S	Group Discussions
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	-	-
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	S	Group Discussions/ Presentations
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	H	Presentations/ Assignments
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	-	-

S – Supportive

H-Highly Related

VIII. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

Program Specific Outcomes		Level	Proficiency Assessed by
PSO1	Engineering Knowledge: Graduates shall demonstrate sound knowledge in analysis, design, laboratory investigations and construction aspects of civil engineering infrastructure, along with good foundation in mathematics, basic sciences and technical communication.	H	Assignment, Tutorials Exams
PSO2	Broadness and Diversity: Graduates will have a broad understanding of economical, environmental, societal, health and safety factors involved in infrastructural development, and shall demonstrate ability to function within multidisciplinary teams with competence in modern tool usage.	H	Projects
PSO3	Self-Learning and Service: Graduates will be motivated for continuous self-learning in engineering practice and/ or pursue research in advanced areas of civil engineering in order to offer engineering services to the society, ethically and responsibly.	-	-

S - Supportive

H - Highly Related

IX. SYLLABUS:

UNIT-I

Management process- Roles. Management theories, Social responsibilities, Planning and strategic management strategy implementation. Decision making: tools and techniques - Organizational structure. Human resource management- motivation performance - leadership.

UNIT-II

Classification of Construction projects, Construction stages, Resources- Functions of Construction Management and its Applications .Preliminary Planning- Collection of Data-Contract Planning — Scientific Methods of Management: Network Techniques in construction management – Bar chart, Gant chart, CPM, PERT- Cost & Time optimization.

UNIT-III

Resource planning – planning for manpower, materials, costs, equipment. Labour - Scheduling. Forms of scheduling – Resource allocation. Budget and budgetary control methods.

UNIT-IV

Contract – types of contract, contract document, specification, important conditions of contract — tender and tender document – Deposits by the contractor – Arbitration. Negotiation – M. Book – Muster roll - stores.

UNIT-V

Management Information System – Labour Regulations: Social Security – welfare Legislation – Laws relating to Wages, Bonus and Industrial disputes, Labour Administration – Insurance and Safety Regulations – Workmen’s Compensation Act -other labour Laws – Safety in construction: legal and financial aspects of accidents in construction. Occupational and safety hazard assessment. Human factors in safety. Legal and financial aspects of accidents in construction. Occupational and safety hazard assessment.

TEXT BOOKS

1. Ghalot, P.S., Dhir, D.M., Construction Planning and Management, Wiley Eastern Limited, 1992.
2. Chitkara, K. K., Construction Project Management, Tata McGraw Hill Publishing Co, Ltd., New Delhi, 1998.
3. Punmia, B. C., Project Planning and Control with PERT and CPM, Laxmi Publications, new delhi,1987.
4. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Building Construction, 10th Edition, Laxmi Publications (P) Ltd., New Delhi, 2010
5. B.C. Punmia, K.K. Khandelwal, Project Planning and Control with PERT and CPM, 4th Edition, Lakshmi Publications (P). Ltd., New Delhi, 2010.
6. Jha, Construction Project Management, 1st Edition, Pearson Publications, New Delhi, 2011.

REFERENCE

1. Construction Management And Planning by: Sengupta, B. /guha, h. Tata McGraw-hill publications
2. S. Seetharaman, Construction Engineering and Management, 3rd Edition, Umesh Publications, Delhi, 2010
3. R. Chudly, Construction Technology – Vol. I and Vol. II, 4th Edition, Longman, UK, 1987.
4. P.K. Joy, Total Project Management: The Indian Context, 1st Edition, Mac Millan Publishers India Limited, 1993.

X. COURSE PLAN:

At the end of the course, the students are able to achieve the following course learning outcomes:

Lecture Number	Topics Planned to cover	Learning Objectives	References
1-3	Management process- Roles.management theories Socialresponsibilities	Understand the importance of Management and social responsibilities	T1: 1-3
4-6	Planning and strategic managementstrategy implementation	Analyze and understand Planning and strategic Management	T1: 2.2-2.7
7-8	Decision making: tools and techniques Organizational structure	Emphasize the decision making with different tools	T1: 2.6-14
9-10	Human resource management- motivation performance- leadership	Understand resource management strategies	T1: 2.15-20
11-14	Classification of Construction projects, Construction stages, Resources	Analyze the different construction stages	T1: 3.1-.3
15-16	Functions of Construction Managementand its Applications	Understand the role of Construction Manager	T1: 3.5-14
17-18	Preliminary Planning- Collection of Data-Contract Planning	Analyze and understand contract planning	T1: 6.1-5
19-20	Scientific Methods of Management	Understand the different scientific methods of management	T1: 9.1-5
20-22	Network Techniques in constructionmanagement	Understand and application of Network techniques in construction	T1: 9.6-7
23-26	Bar chart, Gant chart, CPM, PERT	Application ofManagement tools like Bar Chart, Gant Chart, CPM and PERT	T1: 9.7-15
27-28	Cost & Time optimization	Understand Cost and Time Optimization techniques	T1: 9.15-20
29-31	Resource planning – planning formanpower, materials	Planning Manpower and material	T1:9.21-25
32-34	Resource planning – planning for, costs, Equipment Labour	Planning costs, equipment.Labour of the project	T1: 10.1-5
35-36	Scheduling .Forms of scheduling.Resource allocation	Understand the resource allocation and scheduling	T1: 10.5-7
37-39	Budget and budgetary control methods	Define budget andunderstand its controlmethod	T1: 10.7
40-42	Contract – types of contract, contractdocument, Contract Specification	Define contract, specification and Types	T1: 10.8-10
43-44	Important conditions of contract	Understand the different conditions of contract	T1: 11.1-7
45-46	Tender and tender document – Deposits by the contractor	Define and understand tender document and deposit	T1: 4.1
47-48	Arbitration. Negotiation – M. Book –Muster roll -stores.	Understand the terms Arbitration, negotiation, M book and muster roll	T1: 4.2-8
48-49	Management Information System	Understand MIS	T1: 5.1-8
50-54	Labour Regulations: Social Security –welfare Legislation – Laws relating to Wages, Bonus	Define, understand and apply labour rules, regulation	T1: 7.1-3

	and Industrial disputes	and governing laws	
55-57	Labour Administration – Insurance and Safety Regulations	Understand labour administration process with insurance and safety concerns	T1: 7.4-7
58-60	Workmen’s Compensation Act –other labour Laws – Safety in construction	Understand the Acts related to labour	T1: 12.1-3
61-62	Legal and financial aspects of accidents in construction	Understand the Acts related to labour	T1: 12.4-11
63-64	Occupational and safety hazard assessment. Human factors in safety	Understand the importance of safety and its factors	T1: 13.1-10
65-67	Legal and financial aspects of accidents in construction	Analyze the legal and financial issues involved in accidents construction	T1: 14.1-8
68-69	Occupational and safety hazard assessment	Assessment of occupational and safety hazard issues	T1: 15-18
70-71	Labour Regulations: Social Security –welfare Legislation – Laws relating to Wages, Bonus and Industrial disputes	Define, understand and apply labour rules, regulation and governing laws	T1: 7.1-3
72	Budget and budgetary control methods	Define budget and understand its control method	T1: 10.7
73	Bar chart, Gant chart, CPM, PERT	Application of Management tools like Bar Chart, Gant Chart, CPM and PERT	T1: 9.7-15
74	Tender and tender document – Deposits by the contractor	Define and understand tender document and deposit	T1: 4.1

XI. MAPPING COURSE OBJECTIVES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES:

Course Objectives	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
I	H	H								S				H	
II		S		S							S		H		
III	S					H		S						H	
IV		S													
V	H			S				S					H		
VI		H	S			H								H	

S= Supportive

H = Highly Related

XII. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES:

Course Outcomes	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	H			S										H	
2		S					S							H	
3		H				H							H		
4	H														
5		S		S										H	
6	S		S				S				S		H		
7		S												H	
8	S										S				
9						H								H	
10						S									
11			S					S						H	
12			S				S								

S= Supportive

H = Highly Related

Prepared by:

Mr. Ch. Balakrishna, Assistant Professor

HOD, Civil Engineering